

FINAL

**ENVIRONMENTAL REPORT
Jefferson Proving Ground
Madison, Indiana**

**U.S. Department of the Army
Soldier and Biological Chemical Command
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ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
ALARA	as low as reasonably achievable
ANG	Air National Guard
AR	Army Regulation
ARPA	Archeological Resources Protection Act
BGS	below ground surface
BLM	Bureau of Land Management
BRAC	Base Realignment and Closure Act of 1988
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERFA	Community Environmental Response Facilitation Act of 1992
<i>CFR</i>	<i>Code of Federal Regulations</i>
cfs	cubic feet per second
cm	centimeter
cm/sec	centimeters per second
COC	chemical of concern
DCGL	derived concentration guideline limit
DOD	U.S. Department of Defense
DP	Decommissioning Plan
DU	depleted uranium
E	Endangered
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ER	Environmental Report
FE	Federally Endangered
FMP	Fire Management Plan
FONSI	Finding of No Significant Impact
FS	Feasibility Study
FT	Federally Threatened
ft	foot or feet
ft ³	cubic feet
FWS	U.S. Fish and Wildlife Service
GPR	ground-penetrating radar
HE	High Explosives
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
in.	inches
INSC	Indiana Special Concern
IRP	Installation Restoration Program
IWI	Index of Watershed Indicators
JPG	Jefferson Proving Ground
kg	kilogram
km	kilometer

km ²	square kilometers
KSNPC	Kentucky State Nature Preserves Commission
KYE	Kentucky Endangered
KYSC	Kentucky Special Concern
m	meter
m ³	cubic meters
m ³ /sec	cubic meters per second
MIDCOR	Madison-Jefferson County Industrial Development Corporation
mm	millimeter
MMI	Modified Mercalli Intensity
MOA	Memorandum of Agreement
mrem/yr	millirem per year
MW	monitoring well
MWH	Montgomery Watson Harza
NA	not applicable
NAGPRA	Native American Graves Protection and Repatriation Act
NaI	sodium iodide
NCDC	National Climatic Data Center
NCSHPO	National Conference of State Historic Preservation Officers
NE	Northeast
NFA	No Further Action
NHPA	National Historic Preservation Act
NMSS	Office of Nuclear Material Safety and Safeguards
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NW	Northwest
NWR	National Wildlife Refuge
NWS	National Weather Service
%	percent
pCi/g	picocuries per gram
pCi/L	picocuries per liter
ppb	parts per billion
R	Rare
RAB	Restoration Advisory Board
RESRAD	Residual Radiation
RI/FS	Remedial Investigation and Feasibility Study
Rust E&I	Rust Environment and Infrastructure
S	South
SAIC	Science Applications International Corporation
SARA	Superfund Amendments and Reauthorization Act of 1986
SBCCOM	Soldier and Biological Chemical Command
SEG	Scientific Ecology Group
SHPO	State Historic Preservation Officer
SRP	Standard Review Plan
STOLS	surface-towed ordnance locator system
STV	Save the Valley
SVOC	semivolatile organic compound
T	Threatened
TEDE	Total Effective Dose Equivalent
U	uranium

USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine
USAEC	United States Army Environmental Center
USAF	U.S. Air Force
USATSDR	U.S. Agency for Toxic Substances and Disease Registry
USDA	U.S. Department of Agriculture
USDHHS	U.S. Department of Health and Human Services
USGS	United States Geological Survey
UXO	unexploded ordnance
VOC	volatile organic compound
WHO	World Health Organization
WL	watch list
μCi	microcurie
μm	micrometer
μR/hr	microrentgen per hour

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1.0 INTRODUCTION

This Environmental Report (ER) was prepared in support of the U.S. Army's Proposed Action to terminate its Nuclear Regulatory Commission (NRC) license at the Jefferson Proving Ground (JPG), located in Madison, Indiana. The strategy and program for management of JPG, in general, and the depleted uranium (DU) impact area, in particular, have evolved as the regulations pertaining to DU have developed and changed. Information related to the Proposed Action is derived from numerous source documents, which are referenced throughout this report. The Decommissioning Plan (DP) [U.S. Army 2002b] includes additional information related to the U.S. Army's proposed action to terminate NRC License SUB-1435.

1.1 FACILITY OPERATING HISTORY

The Army's mission at JPG was to perform production and post-production tests of conventional ammunition components and other ordnance items and to conduct tests of propellant ammunition/weapons systems and components. The base was closed in September 1995 under the Defense Authorization Amendments and Base Realignment and Closure Act of 1988 (BRAC). The NRC license was amended for possession of DU only in May 1996 (NRC 1996a) until license termination.

The installation is divided into two areas separated by a firing line consisting of 268 gun positions formerly used for testing ordnance. An east-west fence separates the area north of the firing line from the cantonment area. The firing line demarcates the ordnance impact area to the north from the cantonment area to the south. The cantonment area houses the support facilities that were used for administrative ammunition assembly and testing, vehicle maintenance, and residential housing. The area north of the firing line consists of 51,000 acres (206 km²) of undeveloped and heavily wooded land and contains the NRC-licensed area [Science Applications International Corporation (SAIC) 1997a]. The DU Impact Area is located in the south-central portion of this area, as shown on Figure 1-1.

JPG was used as a proving ground from 1941 to 1994. During this time, more than 24 million rounds of conventional explosive ammunition were fired. Approximately 1.5 million rounds did not detonate upon impact, remaining as unexploded ordnance (UXO) either on or beneath the ground surface (SAIC 1997a).

Under NRC license SUB-1435, the Army tested DU projectiles and munitions from 1983 to 1994 (NRC, Docket 040-08838). This testing was conducted in approximately a 2,080-acre [8.4-square kilometer (km²)] area located in the south-central portion of the installation, referred to as the DU Impact Area (Figure 1-1, located at the end of this report). During its 10-year use, more than 220,462 pounds (100,000 kg) of DU projectiles were fired into the DU Impact Area (SEG 1995, 1996). Approximately 30,000 kg of DU have been removed. Approximately 154,323 pounds [70,000 kilograms (kg)] of DU remain in the DU Impact Area, which also contains one of the largest concentrations of UXO [Scientific Ecology Group (SEG) 1995, 1996].

NRC license SUB-1435 was amended for possession of DU only in May 1996 (NRC 1996a) until license termination. Amendment 10 currently is in effect. NRC License No. 13-12416-01, for the use of scandium-46, was terminated in 1993. Other radionuclides were used under a general Army-wide license.

The DU varies in size from microscopic particles to complete projectiles (SEG 1996). Other NRC-licensed activities at JPG included the storage of DU in buildings located in the cantonment area of the installation. This portion of the site was released for unrestricted use in 1996. The Indiana State Department of

(This oversized figure can be found in the sleeve at the end of this report.)

Figure 1-1. Jefferson Proving Ground

Health, Division of Indoor and Radiological Health, concurred with the findings and recommendations for release of this latter area (NRC 1996b).

The DU projectiles were fired from three fixed gun positions on the firing line at soft targets placed at intervals of 3,280 feet (ft) [1,000 meters (m)], starting at 3,280 ft (1,000 m) from the gun position and continuing to 13,123 ft (4,000 m). Because of the type of testing performed, the DU projectiles would impact approximately the same location each time on their respective lines-of-fire (SEG 1996). This firing protocol, with repeated impacts in the same area, resulted in the formation of a trench approximately 3.4 ft (1 m) deep by 16.4 to 26.3 ft (5 to 8 m) wide extending for approximately 3,937 ft (1,200 m) at the most frequently used gun position. The primary impact location was the trench. Secondary impact locations developed when the projectile skipped, either whole or in fragments. A similar pattern was repeated at each of the other two firing positions but to a lesser extent and magnitude because a smaller quantity of DU was fired from each of these locations (SEG 1996).

1.2 PURPOSE AND NEED FOR ACTION

The active Army mission at JPG ceased on September 30, 1994. Under the Defense Authorization Amendments and BRAC, all mission activities at JPG ceased and were realigned to Yuma Proving Ground, Arizona (SAIC 1997a). Therefore, with the termination of mission operations at the installation, the Army is proposing to terminate the NRC license for the DU Impact Area. In accordance with 10 *Code of Federal Regulations (CFR)* 40.42, the Army notified the NRC of the decision to terminate the NRC license and release the DU Impact Area with a restriction on future land use.

1.3 THE PROPOSED ACTION

The Proposed Action is license termination under restricted conditions. More specifically, the NRC license SUB-1435 would be terminated, and institutional control of the DU Impact Area would be maintained through physical, administrative, and legal mechanisms. Section 4.1 provides additional detail on this proposed action.

1.4 OTHER ENVIRONMENTAL PROGRAMS

Environmental restoration programs at JPG are being conducted under the BRAC Installation Restoration Program (IRP). An environmental restoration program has been in place at JPG for approximately 11 years. In support of the BRAC process, the Army currently is completing a remedial investigation and feasibility study (RI/FS) to evaluate the area south of the firing line and to recommend cleanup activities [Montgomery Watson Harza (MWH) 2002]. These investigations are described in Section 3.2.2. This work has been conducted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and in compliance with applicable Department of the Army requirements. The area north of the firing line has had limited investigation because of the physical hazards associated with UXO (SAIC 1997a).

A Restoration Advisory Board (RAB), an advisory organization composed of local citizens and staff from the Army, the U.S. Environmental Protection Agency (EPA), the Indiana Department of Environmental Management (IDEM), and county officials, was established in 1994 under CERCLA and the BRAC program. The RAB, which meets quarterly, provides the public and community an opportunity to identify environmental and reuse issues and concerns and to participate in the Army's decision-making process. Meeting minutes are documented and included in the Administrative Record. The U.S. Army developed

and is implementing its Community Involvement Plan (SAIC 1997b) and maintains a web site to inform the public on the site closure process (<http://jpg.sbccom.army.mil/>). Public participation requirements associated with 10 *CFR* Part 20.1403 (d) are being conducted through this forum.

In addition, the Army has been identifying and transferring property in accordance with the Community Environmental Response Facilitation Act of 1992 (CERFA) [Earth Technology Corporation 1994]. CERFA amended Section 120 (h) of CERCLA, establishing requirements to identify real property that can be reused and redeveloped. To date, approximately 1,463 acres (6 km²) located south of the firing line have been transferred for private, recreational, or commercial use. In addition, approximately 2,400 acres (9.8 km²) south of the firing line are being leased to a local businessman. Currently, 765 acres (3 km²) are in the process of being transferred. A UXO clearance of approximately 300 acres (1.2 km²) located south of the firing line began in November 2001 (see <http://jpg.sbccom.army.mil/>).

UXO present on JPG is managed in accordance with the U.S. Army and U.S. Army Engineering and Support Center, Huntsville, requirements involving ordnance and explosives (OE) investigations and removal actions. UXO potentially is present throughout the 55,264-acre (224-km²) facility (USACE 1995).

1.5 APPLICABLE REGULATORY REQUIREMENTS, PERMITS, AND REQUIRED CONSULTATIONS

This section identifies agreements, consultations, and permits relating to the management of JPG, including the DU Impact Area. Table 1-1 summarizes the consultations completed in support of installation operations and BRAC closure.

1.5.1 Memorandum of Agreement

A Memorandum of Agreement (MOA) [Appendix A] between the U.S. Army, U.S. Air Force (USAF), and the U.S. Fish and Wildlife Service (FWS), signed in May 2000, establishes a framework to authorize the future use of the firing range by the FWS and USAF and assigns responsibilities for the management of the area of JPG north of the firing line (U.S. Army 2000). These responsibilities include shared infrastructure management activities, including maintaining buildings, roads, fencing, and signs (see Enclosure 5 of the MOA). The MOA grants permits to both organizations, which remain in effect for 25 years and may be renewed for additional 10-year periods upon mutual agreement of all parties.

Under the MOA, the Army retains the authority, responsibility, and liability for contamination (including UXO and DU) resulting from past Army activities. The Army also is authorized to conduct specific activities in the area north of the firing range, such as environmental remediation, UXO technology demonstrations, and property administration (e.g., site inspections). The Army is required to consult with the FWS and USAF prior to transferring fee title or property interests in the firing range.

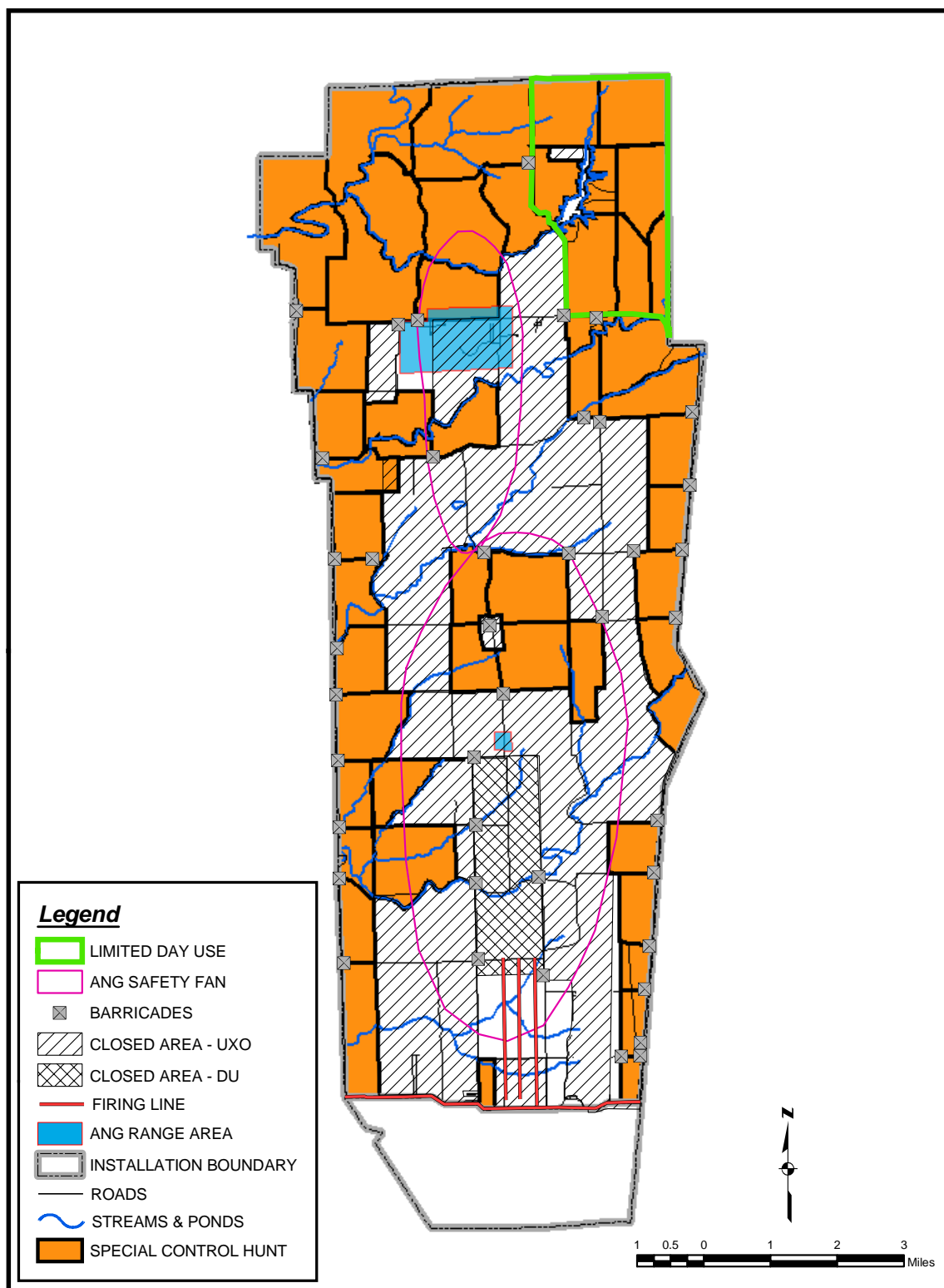
The FWS is responsible for providing UXO, DU, and environmental contamination safety/awareness training to all personnel and visitors to the Big Oaks National Wildlife Refuge (NWR) and maintaining infrastructure elements not maintained by the USAF. The MOA includes an interim public access plan that identifies requirements and protocols for public access to the Big Oaks NWR. This plan also outlines FWS, Army, and USAF-related responsibilities regarding safety briefings, entry procedures, types of public use and areas of accessibility (see Figure 1-2), and monitoring and control procedures. Public use of the Big Oaks NWR is limited to hunting, fishing, wildlife observation, photography, and guided tours. The maximum one-time capacity on the refuge is limited to 423 people during deer hunting season in November. Visitors to the Big Oaks NWR must check in and check out and receive a safety briefing at

Table 1-1. Consultations and Agreements Completed at JPG to Support Operations and BRAC Closure

Consultation	Applicable Law or Regulation	Activity	Status	Reference
Retrocession of Authority	<ul style="list-style-type: none"> • U.S. Code Section 2683 (a) • Indiana Code Annotated Sections 4-20.5-18-1 to 2.20.5-18-3 	Retrocession of exclusive jurisdiction	Complete	U.S. Army 1995a
Cultural Resources Management Plan	<ul style="list-style-type: none"> • NHPA of 1966 • EO 11593 • ADA of 1992 • ARPA 1979 • NAGPRA of 1990 • AR 200-4 and 420-40 • MOA between DA, Advisory Council on Historic Preservation, and Indiana State Historic Preservation Officer • MOA between U.S. Army, ACHP, and NCSHPO 	Identification, evaluation, and management of historic properties	Complete	Geo-Marine 1996
Fish and Wildlife Management Plan	<ul style="list-style-type: none"> • Fish and Wildlife Conservation Act of 1958 • Endangered Species Act of 1973 • Migratory Bird Treaty Act of 1918 	Development of plan to manage fish and wildlife resources	Complete	FWS 1994a
National Wildlife Refuge	<ul style="list-style-type: none"> • National Wildlife Refuge Administration Act of 1966 • MOA for JPG Firing Range 	Establishment of National Wildlife Refuge	Complete	U.S. Army 2000
Bombing Range	<ul style="list-style-type: none"> • MOA for JPG Firing Range • Air Force Instruction 13-2-2, Test and Training Ranges 	Continued Use of the Bombing Range	Complete	U.S. Army 2000

ACHP = Advisory Council on Historic Preservation.
 ADA = Americans with Disabilities Act.
 ARPA = Archeological Resources Protection Act.
 AR = Army Regulation.
 BRAC = Base Realignment and Closure Act of 1988.
 EO = Executive Order.
 FWS = U.S. Fish and Wildlife Service.

MOA = Memorandum of Agreement.
 JPG = Jefferson Proving Ground.
 NAGPRA = Native American Graves Protection and Repatriation Act.
 NHPA = National Historic Preservation Act.
 NCSHPO = National Conference of State Historic Preservation Officers.



Source: USFWS 2002b

Figure 1-2. Potential Public Use of Big Oaks National Wildlife Refuge

the refuge office before being issued a public access permit. Public access to the refuge is controlled strictly at one gate and is limited to two areas: limited day use recreation and special controlled hunting zones. All of these recreational areas were used previously in the Army recreation program. Public use areas are delineated by maps and on signs placed at strategic locations within the Big Oaks NWR.

In support of its responsibilities under the MOA, the FWS has issued several related documents. These documents include an Interim Comprehensive Conservation Plan (FWS 2001a), a Big Oaks NWR Interim Hunting and Fishing Plan (FWS 2001b), an Interim Compatibility Determination (FWS 2001c), a Fire Management Plan (FMP) [FWS 2001d], and an Environmental Assessment (EA) [FWS 2001e]. The FMP describes the goals, objectives, and procedures for implementing prescribed fires within the Big Oaks NWR. Prescribed burns are used to enhance habitat critical to maintain the diversity of plant community and associated wildlife species. Two of the four fire management units outlined in this plan encompass the DU Impact Area. The EA addresses the impact of implementing the FMP at the Big Oaks NWR. The FWS determined that this proposed action would have no significant impact on the environment. Accordingly, a Finding of No Significant Impact (FONSI) was issued.

The USAF operates the Jefferson Range Operations Center within a demarcated area north of the firing line. The Jefferson Range consists of 983 acres (3.9 km²) used as the primary training range, a 50-acre (0.2-km²) precision-guided munitions target, and the Old Timbers Lodge and the surrounding 5 acres (0.02 km²).

All access to the range is through the Big Oaks NWR. Each range has an associated weapons safety footprint. The primary training range has a composite footprint of approximately 5,100 acres (20.6 km²). The precision-guided munitions target has a composite footprint of approximately 14,860 acres (60.1 km²) [see Figure 1-1].

During flight operations, only USAF personnel are permitted access into the weapons safety footprints. When the USAF is not using the safety footprints, the FWS has access to this area. Access to the range is controlled through four gates. USAF personnel maintain and inspect the JPG perimeter fence. The USAF also maintains the barricades on access roads to the footprint of the precision-guided munitions target and interior areas north of the firing line. These barricades are located where the interior roads exit to the eastern and western perimeter roads. The USAF also maintains UXO safety signs on the perimeter fence and gates, as well as radiation hazard signs around the perimeter of the DU Impact Area.

1.5.2 Section 106 Consultation

Cultural resources at JPG are addressed in the 1992 Amended BRAC preliminary assessment between the Army, Advisory Council on Historic Preservation (ACHP), and the National Conference of State Historic Preservation Officers (NCSHPO) as well as the MOA between the Army, ACHP, and the Indiana State Historic Preservation Officer (SHPO). All of the National Register of Historic Places (NRHP)-listed or NRHP-eligible properties at JPG should be protected, preserved, or mitigated for loss if primary or secondary impact is unavoidable. The MOA indicates that properties of unknown NRHP eligibility must be considered potentially eligible and should be protected and preserved until the NRHP evaluation process is complete (SAIC 1997a).

JPG's Cultural Resources Management Plan provides guidelines and procedures to identify, evaluate, and manage historic properties under its jurisdiction (Geo-Marine 1996). Plans and procedures for inventorying cultural resources and assessment of archaeological sites and resources for nomination to the NRHP have been in effect since the mid-1990s. To date, there are two buildings and four bridges at JPG listed on the NRHP.

1.5.3 Other Permits

Prior to installation closure in 1995, JPG maintained various permits in support of mission operations. These permits included a Resource Conservation and Recovery Act of 1976 (RCRA) permit (Part A, “Interim,” and Part B, “Application”), a National Pollutant Discharge Elimination System (NPDES) permit, a Fire Training Permit, an Open Burning/Open Detonation Permit, and an Air Permit. After installation closure, these permits were transferred or allowed to expire. Currently, there are no permits in effect at JPG (MWH 2002).

As a result of the installation’s closure, the Federal government retroceded exclusive jurisdiction over JPG to the State of Indiana. In effect, the state was granted the authority to enforce its laws for activities occurring on the facility (U.S. Army 1995a).

The U.S. Army was issued and maintains NRC license SUB-1435 pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, and 10 *CFR* Chapter I, Parts 30–40 and 70. A request to terminate this license under restricted conditions currently is under evaluation (U.S. Army 2002b).

1.6 ORGANIZATION OF THIS REPORT

This ER includes the following sections:

- Section 1.0 – This section provides an overview of the purpose and need for the proposed action, other environmental programs at JPG, and applicable regulations, permits and consultations.
- Section 2.0 – In this section the site location and environmental conditions is described.
- Section 3.0 – The nature and external contamination in the DU Impact Area is described.
- Section 4.0 – The Proposed Action and alternatives are identified in this section.
- Section 5.0 – In this section, the impact of the Proposed Action and alternatives is assessed.
- Section 6.0 – This section presents the as low as reasonably achievable (ALARA) analysis results.
- Section 7.0 – References in this report are specified.
- Appendices – The following appendices are included in this report:
 - Appendix A – Memorandum of Agreement
 - Appendix B – JPG Photos
 - Appendix C – Visual Resource Inventory

2.0 FACILITY DESCRIPTION

The characterization of the existing environment is based primarily on information contained in the 1995 Final Environmental Impact Statement (EIS) that evaluated disposal and reuse of JPG (U.S. Army 1995b) and the RI/FS [Rust Environment and Infrastructure (Rust E&I) 1994, 1998; MWH 2002], and supplemented by Internet searches to obtain current information. The discussion of land use north of the firing line is based on information from the MOA between the U.S. Army, USAF, and FWS, signed in 2000 (U.S. Army 2000) [Appendix A].

2.1 SITE LOCATION AND DESCRIPTION

JPG occupies approximately 55,264 acres (224 km²) in Jefferson, Jennings, and Ripley Counties in southeastern Indiana and is located west of U.S. Highway 421, approximately 5 miles (8 km) north of Madison, Indiana. Major metropolitan areas include Louisville, Kentucky, approximately 45 miles (72 km) southwest; Cincinnati, Ohio, approximately 75 miles (121 km) northeast; and Indianapolis, Indiana, approximately 85 miles (137 km) north-northwest (SAIC 1997a). The installation is located approximately 8 miles (13 km) north of the Indiana-Kentucky border (Figure 2-1).

The DU Impact Area is approximately 17,283 ft (5,268 m) long and 5,240 ft (1,597 m) wide and covers an area of approximately 2,080 acres (8.4 km²). The northern and southern boundaries of the DU Impact Area are F Road and slightly south of C Road, respectively. Morgan Road and Wonju Road form the western and eastern boundaries, respectively (see Figure 1-1).

There is inconsistency in source documentation (e.g., SEG 1995, 1996; U.S. Army 1995b; NRC 1995, 1996c, 2000a) on the shape and size of the DU Impact Area. The size and borders depicted in this ER are consistent with the SEG reports, the NRC's annual safety reviews of the site (NRC 2001a), and the signage present around the perimeter of the DU Impact Area.

The terrain in the area is rolling with both wooded and grassy areas. In addition to the natural rolling topography, there are several munitions-made trenches. Man-made features are limited, but a fence system surrounds the entire installation, and an east-west fence separates the area north of the firing line from the cantonment area.

2.2 SOCIOECONOMICS AND POPULATION

The DU Impact Area is located in Jefferson County, which has a population of approximately 31,705 people. The county has undergone approximately 6.4 percent (%) growth from 1990 to 2000, based on 1990 and 2000 census data (U.S. Census Bureau 2000). The nearest population center is the city of Madison, Indiana, which has a population of 12,004 people, approximately one-third of the Jefferson County population. The 2000 census data indicate that approximately 85,782 people live in Jefferson, Jennings, and Ripley Counties combined, covering a radius of more than 15 miles (24 km) from the DU Impact Area. The population in Jefferson, Jennings, and Ripley Counties is projected to increase an average of 2.8, 5.0, and 4.1%, respectively, every 5 years to the year 2020, based on the 1990 census data (U.S. Census Bureau 2000). Table 2-1 indicates the population trends in the vicinity of JPG.

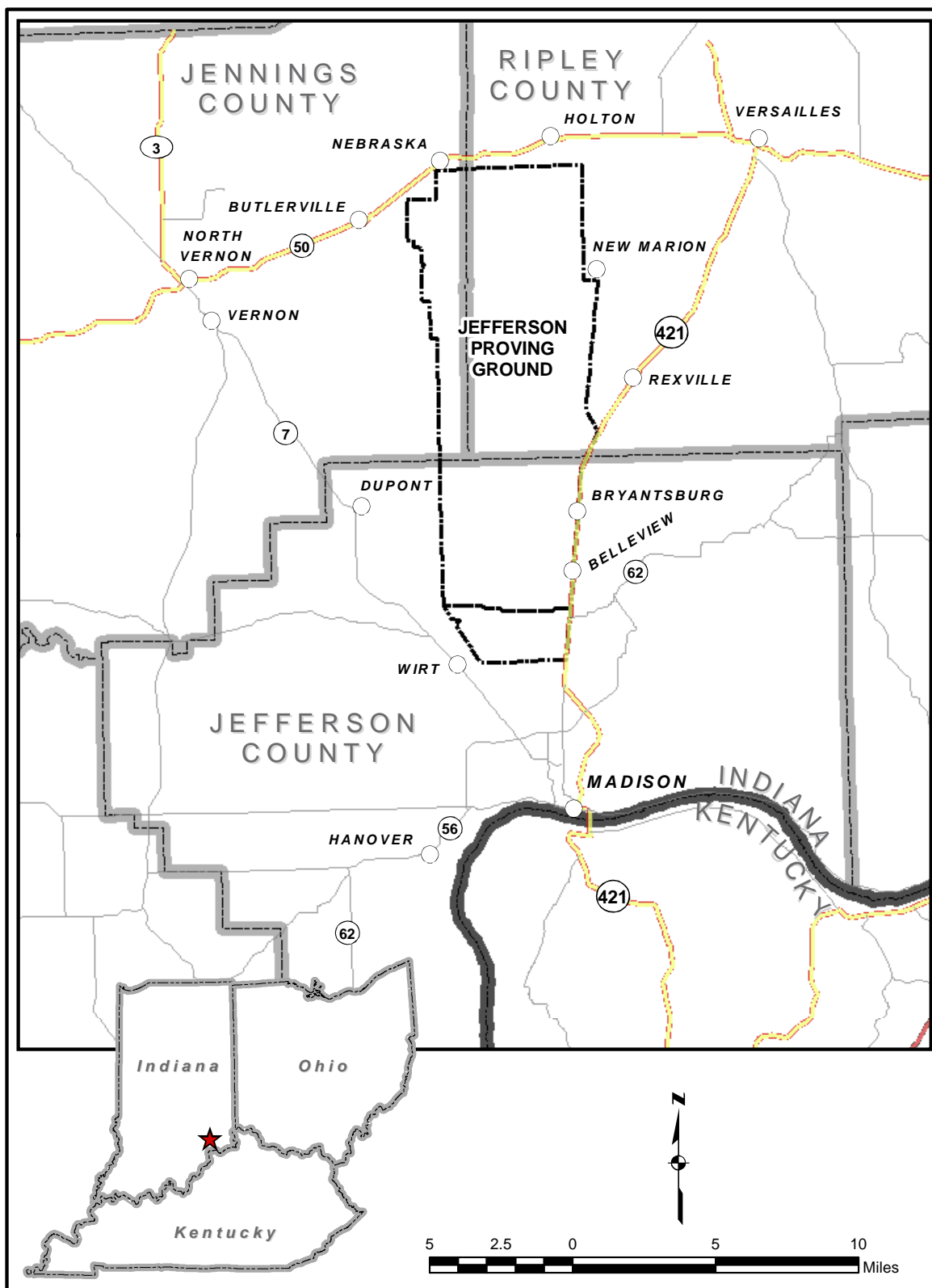


Figure 2-1. Jefferson Proving Ground, Indiana

Table 2-1. Population Trends Near Jefferson Proving Ground

Location	Compass Vector	Population			Population by Race				Household Income				
		2000 Population	% Change (1990–2000)	2020 Projected Population ^c	% White	% Black	% Asian	% Other	Median Income	% Under Poverty Level ^d	% Under \$50K	% \$50-\$100K	% Over \$100K
State of Indiana ^a	NA	6,080,485	9.7	6,481,489	87.5	8.4	1.0	3.1	\$37,909	9.9	NA	NA	NA
Jefferson County ^a	NA	31,705	6.4	35,340	96.2	1.5	0.6	1.7	\$33,630	11.6	NA	NA	NA
City of Madison ^a	S	12,004	NA	NA	94.6	2.4	0.8	2.2	\$37,651	NA	68.6	25.9	5.6
Jennings County ^a	NW	27,554	16.5	33,404	97.5	0.7	0.3	1.5	\$32,121	9.8	NA	NA	NA
City of North Vernon ^b	NW	20,144	NA	NA	98.3	1.1	0.3	0.2	\$37,013	NA	70.1	24.9	5
Ripley County ^a	NNE	26,523	7.7	30,983	98.3	0	0.4	1.3	\$36,854	9.7	NA	NA	NA
City of Versailles ^b	NE	4,145	NA	NA	99.5	0	0.3	0.2	\$34,242	NA	71.3	22.9	5.8
4-Mile (6.4-km) Radius of DU Impact Area ^e	NA	6,943	NA	NA	99.7	0.2	0	0.1	NA	NA	NA	NA	NA

^aSource: U.S. Census Bureau 2000.

^bSource: CACI 2000.

^cCalculated from 1990 census data (U.S. Census Bureau 2000).

^dSource: U.S. Department of Agriculture (USDA) 1997.

^eNumber biased high (overestimates the actual population) because the census block groups used in the analysis cover an area of 282.9 mi² (732.8 km²) instead of 50.3 mi² (130 km²) [the area within a 4-mile (6.4-km) radius].

NA = Not applicable.

The average minority population in the State of Indiana is 12.5%. The minority population within Jefferson, Jennings, and Ripley Counties averages approximately 2.7% of the total population in these counties as shown in Table 2-1. The minority population within the immediate area [i.e., a 6.4-km (4-mile) radius of the installation] is less than 0.3% of the population living within that radius. The highest median income of \$36,854 occurs in Ripley County. The lowest median income of \$32,121 occurs in Jennings County. Approximately 12% of people residing in Jefferson County have incomes below poverty level [U.S. Department of Agriculture (USDA) 1997], defined as an income of \$17,650 for a family of four [U.S. Department of Health and Human Services (USDHHS) 2001].

Property tax rates in 2001 in Jefferson County ranged from 7.5541 to 9.9703, averaging 8.005 (i.e., \$8.005 per \$100 of assessed value). These rates are similar to those applied in Ripley and Jennings Counties (see <http://www.in.gov/dlgf/taxrates/archive.html>) [Indiana State Board of Tax Commissioners 2002]. The distribution of the assessed property value is approximately 35% commercial/industrial, 32% residential, 14% agricultural, and 19% utilities (<http://www.stats.indiana.edu/profiles/pr18077.html>) [State of Indiana and Indiana Department of Commerce 2002].

The major industry in Jefferson County is automotive manufacturing, supporting heavy-duty trucking, Toyota, and automotive lifts. Approximately 4,000 people are employed in this industry, with approximately 850 working for Grote Manufacturing. Other industries in Jefferson County are chemicals and plastics companies, which employ a small fraction (approximately 200 people) of the population (SAIC 2001a).


Farming in Jefferson County includes the following crops: corn (110 bushels/acre), soybeans (34 bushels/acre), hay [3 tons/acre (2,722 kg/acre)], and tobacco [2,100 pounds/acre (952 kg/acre)]. The growing season lasts from approximately May 5 to October 15.

Active munitions testing at JPG ceased in September 1994. The number of employees at JPG has dropped from 421 at the time of base closure to a full-time staff of three people (U.S. Army 1995b). Currently, 13 businesses located in the cantonment area employ approximately 100 people for metal stamping, plastics molding, welding, tooling, engineering, and other manufacturing activities (see Section 2.3). Thirteen houses and several apartments also are present, providing homes to approximately 50 people, all adults (SAIC 2001b).

The FWS maintains a full-time staff of six permanent positions for maintenance of the Big Oaks NWR (SAIC 2001c). There are no residents north of the firing line.

The U.S. Army has identified and addressed community interests and concerns throughout its operation and during installation closure. The community involvement program, documented in JPG's Community Involvement Plan (SAIC 1997b), includes the opportunity to participate in the installation's RAB.

Key community groups and planning organizations in this region are identified below:

- **Save the Valley (STV)** – A non-profit volunteer organization for protection of air, water, and land in the Valley of the Ohio River between Lawrenceburg, Indiana, and Louisville, Kentucky. STV represents environmental and public interests before regulatory agencies and at all levels of the court system and has been an active participant in the JPG RAB (see <http://www.oldmadison.com/stv/>).
- **Jefferson County** – Planning for the county is implemented through the Jefferson County Area Planning Commission (except for Madison and Hanover) [see the Jefferson County website: <http://www.indico.net/counties/JEFFERSON/> - **The Madison-Jefferson County Industrial Development Corporation (MIDCOR)** – A non-profit organization whose mission is to facilitate retention/expansion of existing industries and to attract

new, complimentary industries to Jefferson County and Historic Madison, Indiana (see <http://www.madisonindiana.org/midcor/>).

- **Ripley County** – Planning for the county is implemented through the Area Planning Commission (see the Ripley County website: <http://www.indico.net/counties/RIPLEY/>).
- **Jennings County** – Planning for the county is implemented through the Jennings County Area Planning Commission (see the Jennings County website <http://www.indico.net/counties/JENNINGS/>).

2.3 LAND USE

The majority of land surrounding JPG is rural agricultural (see Figure 2-2). The adjacent land use has changed little since establishment of the installation in the 1940s and has been used predominantly for small family farms since the early 1800s. JPG is surrounded by several small rural towns. Approximately 100 farmhouses and other dwellings are located within 1 mile (1.6 km) of JPG south of the firing line (Rust E&I 1998; MWH 2002). The major local crops are tobacco, corn, and soybeans.

The FWS established the Big Oaks NWR in the area north of the firing line in June 2000. Under a negotiated MOA (Appendix A) between the U.S. Army, USAF, and the FWS, the Army will retain ownership of the land and the FWS will operate the Big Oaks NWR on a 25-year lease with 10-year renewal options. The Big Oaks NWR encompasses more than 50,000 acres (202 km²) of grasslands, woodlands, and forests, including the DU Impact Area. Access to approximately 24,000 acres (97 km²) of land is restricted by the FWS within the refuge because of the occurrence of both UXO and DU.

The Indiana Air National Guard (ANG) also operates a bombing range north of the firing line. The bombing range includes an approximately 50-acre (0.2-km²) precision-guided munitions range, an approximately 983-acre (4-km²) conventional bombing range, and approximately 5 acres (0.02 km²) associated with the Old Timbers Lodge (Figure 1-1). These areas are excluded from the real estate permit for the refuge. When in use, the bombing ranges have large safety fans. FWS personnel and visitors are excluded from the bombing ranges (inclusive of the safety fan) during flight operations involving training munitions or laser energy (U.S. Army 2000).

To date, approximately 1,463 acres (6 km²) located south of the firing line have been transferred for private, recreational, or commercial use. In addition, approximately 2,400 acres (9.8 km²) south of the firing line are being leased to a local businessman. This property is used for light industrial, commercial, agricultural, and residential purposes. The fee title will be transferred as the parcel is remediated of ordnance and other contamination.

2.4 METEOROLOGY/CLIMATOLOGY AND AIR QUALITY

The climate at JPG is mid-continental with frequent changes in temperature and humidity because of the low- and high-pressure systems that routinely pass through the area and the occasional influx of warm, humid air from the Gulf of Mexico. During the summer, the temperatures average from the mid-70 to the mid-80 degrees Fahrenheit (°F) [21 to 27 degrees Celsius (°C)]. On average, the temperature exceeds 90°F (32.2°C) for 39 days a year. Winter temperatures generally range from 22 to 35°F (-5.6 to 1.7°C) [MWH 2002].

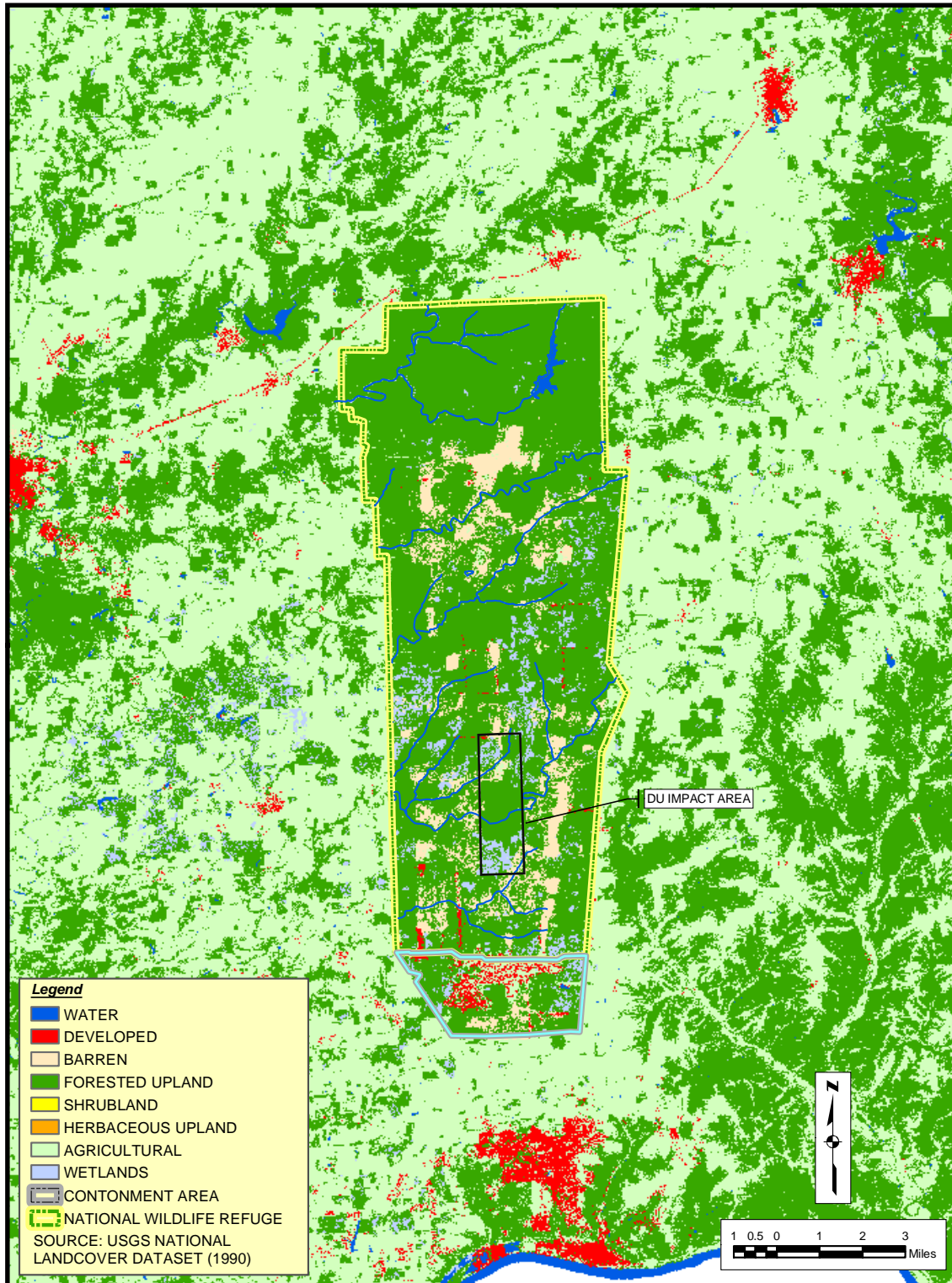


Figure 2-2. Land Use at JPG and Surrounding Areas